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# Operational and Mission Highlights

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A MONTHLY SUMMARY OF TOP ACHIEVEMENTS

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**October 2021**

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## Detonator Production Ships Lot 3354

Working with the Design Agency (Q-6), Production Agency Quality (PAQ) Division, and the NNSA Los Alamos Field Office, Detonator Production recently sold Lot 3354 to NNSA. Detonator Production personnel shipped the lot to Pantex — the Laboratory will continue to support the W76 into the future. The sale and shipment of Lot 3354 was accomplished before the closeout of FY21, achieving a key milestone that required active participation from several stakeholders within the Lab, as well as organizations external to the Laboratory. Both organizations found remedies to address challenges associated with this lot that had persisted since 2019.

## DPP-3 Shock and Vibration Testing Successful

In September 2021, weapons engineers successfully completed shock and vibration testing on the Defense Program Package-3 (DPP-3), which consists of new shipping containers for weapons components. These tests were the first of their kind for these shipping containers, which had been in development for the past six years.

Data collected from these recent tests demonstrate how contents inside behave during shipping from Pantex to the Y-12 National Security Complex in Oakridge, Tennessee. Scientists may also use these data to predict the lifespan of weapons components, taking into account how much the stress associated with transport affects the reliability of the weapon components.

To conduct the DPP-3 tests, scientists placed instrumentation directly on the mock components. An embedded data-acquisition system kept the experiment compact and mobile — an appropriate approach when conducting an actual test in an over-the-road transportation environment.

The team conducting these tests saved money and completed the work despite COVID-19 delays by using National Technical Systems in California to conduct the shock and vibration tests. To carry out these tests, the Laboratory's Operations and Weapons Engineering organizations joined forces with Packaging and Transportation (PT), Mechanical and Thermal Engineering (E-1), Test Engineering (E-14), and Weapon Production Definition (W-11).

## Laboratory Publishes Analysis of Historical Plutonium Pit Production

In a manuscript submitted to NNSA on September 28, 2021, the Laboratory chronicles how scientists have synthesized the nature of defects and discontinuities in plutonium pit production from historical production in the Lab's Plutonium Facility at TA-55. This work is a first step to prioritize efforts to reduce the negative effects of defects on product disposition and waste, in support of the FY23 Stewardship Capability Delivery Schedule pegpost "Enabling Efficient and Flexible Pit Production."

## Mentorship Program Expanded in Weapons Engineering

In September 2021, Associate Laboratory Director for Weapons (ALDW) Engineering James Owen launched a directorate-wide mentorship program. This program pairs 124 employees with mentors through a new software application known as MentorcliQ. Rather than manually pair employees MentorcliQ did the bulk of the job through integrated administrative and engagement support. This year's expanded and software-boosted program supports almost three times the number of mentees accommodated previously.

ALDW has always valued mentoring, and the directorate has grown its formal mentorship program over the last three years. It began in W (Weapons System Engineering) and Q (Weapons Stockpile Modernization) divisions and later included E (Engineering Technology and Design) Division, with participation ranging from 25 to 45 mentees. Although ALDW has embraced the software advantages of MentorcliQ, division management teams and personnel in Human Resources remain closely involved to maintain a strong human element in the mentoring process.

The mentorship program develops employees by pairing them with mentors who can support them in navigating career options, increasing their professional skills, and expanding their ability to contribute to the mission from a more broad perspective.

## MR&R Completes Special Material Shipment

Members in the Materials Recovery and Recycle (MR&R) group (AMPP-4) recently completed Pu-242

metal preparation and shipment. This extensive effort involved preparing, packaging, and shipping materials with support from multiple organizations at TA-55 and the Laboratory. Essential to national security, the process also ensured that workers remained safe and all security requirements were met.

AMPP-4 also safely repacked 50 items in the vault while meeting all safety and security requirements, thus improving the safety of the vault and meeting the L2 milestone. The vault's secure space is of paramount importance to the mission of TA-55 and the Associate Laboratory Directorate for Weapons Production. By ensuring legacy materials are removed, the MR&R program provides a critical tool for the Laboratory's mission.

## New Plutonium Infrastructure Directorate Appoints Leadership Team

Established within the Laboratory's Weapons Program to execute the 30-Pits-Per-Year mission by modernizing TA-55's infrastructure and capabilities, the Associated Laboratory Directorate for Plutonium Infrastructure (ALDPI) recently appointed its leadership team.

Tom Bratvold, senior director of the Los Alamos Plutonium Pit Production Project (LAP4), joined ALDPI from the Hanford Site, where he recently served as vice president of a large remediation contract. Bratvold joins the following members of the leadership team:

- Paul Gretskey, senior director of the Chemistry and Metallurgy Research Replacement (CMRR) project, who brings 40 years of experience in high-hazard construction;
- Chris James, senior director of Major Item of Equipment and Balance of Plant, who has nearly 30 years at the Lab, most recently as Nuclear Process Infrastructure division leader in the Weapons Program;
- Carolyn Zerkle, senior director of Project Execution, who has 30 years of experience at the Lab, most recently in the Emergency Management Division leading the Laboratory's COVID-19 response; and
- Dan Mack, who served as chief operating officer (COO) of the Lab's Weapons Program since 2018 and was earlier this summer named COO of ALDPI.

Steve Rottler will continue to act as Associate Laboratory Director until early November 2021, when Mark Anthony will relocate from the European Spallation Source to assume the position.

Laboratory Director Thom Mason established this directorate after CD-1 approval for LAP4 for the modernization of the TA-55 footprint and production capability.

## Owen Selected as NMSU Distinguished Alumni

Associate Laboratory Director for Weapons Engineering and Chief Engineer at the Laboratory James Owen has received the 2021 Distinguished Alumni Award for the College of Engineering from the New Mexico State University (NMSU) Alumni Association. Owen's technical expertise and success in safely leading large, complex projects and programs has made him influential in nuclear weapons security at the Laboratory and across the larger nuclear weapons complex, including the DOE/NNSA, the Department of Defense, and similar organizations in the United Kingdom.

Owen grew up in Peñasco and first became interested in the Laboratory during a school field trip to the Bradbury Science Museum. He pursued rigorous STEM courses at NMSU, where he graduated in 1995 with a BS in Mechanical Engineering. Owen worked at the Lab as an undergraduate student, earned a MS in Engineering from the University of Colorado at Boulder, and then returned to the Laboratory as a staff member.

The NMSU Alumni Association's highest honor goes to recipients based on personal accomplishment, professional achievement, and charitable service. Owen was honored at multiple events during NMSU Homecoming festivities that took place on September 24-25.

## Plutonium Infrastructure Directorate Exceeds Construction Performance Against Scheduled Goal

Since being established in June 2021, the Laboratory's Plutonium Infrastructure Directorate (ALDPI) has consistently exceeded performance against schedule (PAS) goals associated with construction execution within the Plutonium Facility (PF-4). In three of the past five weeks, ALDPI's construction team has surpassed 80 percent PAS, the steady-state average goal set for achievement in March 2022. This exceedance has

demonstrated that ALDPI has already exceeded expectations and is working towards mission execution.

Starting at an execution level of 49 percent for weekly PF-4 construction work activities, ALDPI set PAS goals of 50 percent for July, 60 percent for August, and 70 percent for September. Applying improved planning and execution enabled ALDPI to exceed goals in all three months: 57.1 percent for July, 69 percent for August, and 75.2 percent for September.

In the First Quarter of FY22, ALDPI's focus has shifted to raising the number of construction job activities accomplished by 35 percent by the end of 2021.

## Plutonium Pit Production Project Begins CD-3A Review Process

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Personnel working under the Los Alamos Plutonium Pit Production Project (LAP4) 30 Base Subproject have begun the Critical Decision 3A (CD-3A) independent cost estimate review process. This process seeks NNSA approval of long-lead procurement items required to advance the 30-pits-per-year mission. Long-lead items consist of equipment, services, and/or materials that must be procured well in advance of need because of long delivery times. An NNSA team conducted this review virtually on October 18–19, 2021; it will be followed by a reconciliation meeting at a later date.

Representing the modernization of the footprint and production capability of TA-55, LAP4 upon authorization will initiate up to \$62 million to fabricate and procure gloveboxes and standalone equipment that workers will install in the Laboratory's Plutonium Facility at TA-55.

## Subcritical Experiment Completed at the Nevada National Security Site

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On September 16, 2021, Laboratory personnel completed the Nightshade C subcritical experiment (SCE) at the Nevada National Security Site (NNSS). The Red Sage-Nightshade project consists of a series of subcritical dynamic plutonium experiments designed to measure plutonium ejecta.

Several Laboratory divisions played a significant role in the project, including Pit Technologies (PT), Production Agency Quality (PAQ), Nuclear Process Infrastructure (NPI), and Materials Science and Technology (MST). Nightshade C was the final of three SCEs, each of which

contained six plutonium samples with slightly different characteristics.

Producing the Nightshade experimental packages required expertise from across the production agency, including the development of new processes to produce and cast plutonium, conduct surface machining, assemble the experimental packages, and support the experiments at NNSS. Lessons learned during production and assembly of Nightshade A and B contributed to the success of Nightshade C. All three SCEs were executed in FY21. Once final analysis is complete, the entire data set will provide important information to improve the Laboratory's understanding of plutonium under dynamic conditions and enhance scientific computations and modeling capabilities.

## Thousands of Documents Now Available to Weapons Program Researchers

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As part of a dedicated effort to make weapons-related documents more available, Laboratory personnel have indexed and uploaded more than 15,000 new digital files to the classified Online Vault (OLV) search repository.

A classified, searchable library of the Laboratory's nuclear weapons design and test history, the OLV system serves as a key data repository used by the National Security Research Center (NSRC), the Lab's classified library. Located in the National Security Sciences Building, the NSRC houses nearly 80 years' worth of nuclear security materials, including documents, photos, film, and engineering drawings. These media are both in physical and electronic form and support the Lab's national security mission.

A bulk uploading process enables the NSRC to massively catalog thousands of digitized documents into the ONV at one time, automating the process and thus saving thousands of hours of manual cataloging.

## Two Plutonium Pit Builds Completed Before the End of the Fiscal Year

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The Laboratory's Pit Technologies (PT) Division completed pit builds 24 and 25 before the end of FY21. Personnel implemented several significant process improvements. In total, PT Division built five pits in FY21, thus keeping up with its deliverables while maintaining

safety-driven COVID-19 protocols. Personnel will use these builds as certification units (CERT03 and CERT04). The builds will play an important role as the division moves toward making the First Production Unit (FPU), followed in 2026 by the capability to make 30 pits per year.

## W88 Alt 370 Passed Review, Now Considered a Standard Stockpile Weapon

On October 21, 2021, the Laboratory's Weapons Systems Engineering Division announced that Alt 370, the W88 warhead's most recent alteration, successfully passed the Design Review and Acceptance Group (DRAAG) review and was now considered a standard stockpile weapon. "Standard" means that the Alt 370's entire pedigree has been certified as safe, reliable, and ready to perform as designed if called upon.

Warhead alterations represent limited-scope changes that affect the assembly, maintenance, and/or storage of a weapon. Although an Alt may address identified defects and component obsolescence, it does not change a weapon's operational capabilities. Capable of being launched on a missile aboard Ohio-class submarines, the W88 warhead has been deployed for more than 30 years, and in that time it has been updated to maintain its current state of readiness with the Alt 370.

To prepare for the DRAAG, the W88 Systems Engineering group (W-4) worked with Sandia National Laboratories (SNL), NNSA, and the U.S. Navy. LANL and SNL experts performed hundreds of tests, in addition to modeling, simulation, and analytical activities. The resultant Final Weapon Development Report and its addendum — more than 600 pages of data and analysis — were reviewed by a Department of Defense panel. Months later, the panel, after being presented with pre-briefings, conducted a four-day series of intense question-and-answer sessions, which proved successful.

The DRAAG review follows July's first production unit milestone, a significant step in the weapon-acquisition lifecycle, ensuring all weapons components have been produced through qualified processes. All necessary qualification testing and physics certification activities have been completed; and the first production unit has been built.

## SCIENCE, TECHNOLOGY, AND ENGINEERING

### Four Researchers Honored with Laboratory Fellows Prizes

At a ceremony held on October 6, 2021, the following four researchers were honored with the Laboratory's Fellows Prizes: Bill Daughton, Andrew Gaunt, and Cristiano Nisoli received the Fellows Prize for Research; Eva Birnbaum received the Fellows Prize for Leadership.

"I congratulate Bill, Andrew, Cristiano, and Eva for being recognized with these prestigious awards," said John Sarrao, Deputy Laboratory Director for Science, Technology and Engineering. "Bill's significant advancements in internal confinement fusion, Andrew's key role in transuranic chemistry, and Cristiano's work in magnetic materials have profoundly influenced their respective fields and the Laboratory. Eva's leadership in isotope production has impacted national priorities and differentiated Los Alamos."

The Fellows Prizes for Research recognizes individuals for outstanding research performed at the Laboratory published within the last 10 years and that has had a significant benefit on their discipline or program. The Fellows Prize for Leadership distinguishes individuals for outstanding scientific and engineering leadership at the Laboratory and recognizes the value of such leadership that stimulates the interest of talented young staff members in the development of new technology.

### Improved DOE Exascale Earth System Model Two Times Faster Than Previous Version

The Department of Energy released a new, faster, and more accurate version of its Energy Exascale Earth System Model (E3SM). The Laboratory uses the model, which is two times faster than its earlier version released in 2018, to better understand the Earth's changing climate.

Earth system models have weather-scale resolution and use advanced computers to (1) simulate aspects of the Earth's variability and (2) anticipate decadal changes that will detrimentally affect the U.S. energy sector in coming years. These critical factors include

- regional air/water temperatures, which can strain energy grids;
- water availability, which affects power plant operations;

- extreme water-cycle events (floods and droughts), which impact infrastructure and bio-energy; and
- sea-level rise and coastal flooding, which threaten coastal infrastructure.

The Earth presents an extraordinarily complex system. Earth system simulation helps researchers solve approximations of physical, chemical, and biological governing equations on spatial grids at resolutions that are as fine in scale as computing resources will allow. These simulations are critically important for understanding and predicting how climate change will affect national security.

## Laboratory Capability Simulates Anisotropic Damage in a Quasi-Brittle Material, Thus Enabling Strength Predictions Under Various Stress States

The Laboratory's Advanced Simulation and Computing Program has developed and implemented a new theoretical model that incorporates critical microstructural defects and associated evolution mechanisms. Such incorporations enable scientists to assess the strength and damage of beryllium.

The model includes a description of anisotropic damage associated with quickly propagating cracks under complicated, three-dimensional stress states. It also includes the kinetics of defects; i.e., how fast cracks and dislocations in beryllium can move.

Scientists have implemented this new model into the continuum hydrocode known as FLAG and applied it to simulations of the degradation of damage in a beryllium cylinder undergoing rapid dynamic expansion. This new simulation capability will also enable the parameterization for a host of other quasi-brittle materials of strategic importance to the NNSA.

Members of the Physics and Engineering Materials Project team that completed this work included DJ Luscher, Nitin Daphalapurkar, and Daniele Versino, all from the Laboratory's Fluid Dynamics and Solid Mechanics (T-3) group.

## Laboratory Hosts 2021 Awards Night

On October 6, 2021, the Laboratory held its second annual awards night, honoring hundreds of individuals and teams for achievements that collectively reflect the scope of the Laboratory's mission.

In light of the ongoing COVID-19 pandemic, a limited number of individuals attended in person, with an extensive audience tuning in via Webex. Among other awardees, the Laboratory celebrated professional society members and LANL Fellows, R&D 100 Award finalists, DOE and NNSA awards, and Distinguished Performance Awards.

"In every case, there is a story behind the award," said Laboratory Director Thom Mason. "There were challenges, things that had to be overcome to turn them into resounding successes. And it's those successes that we're really proud to honor today."

## Laboratory Machine-Learning Workshop Supports Hundreds of Programmers

Led by scientist Monty Vesselinov (Earth and Environmental Sciences Division), a group of machine-learning (ML) experts hosted a free, internal, and online Julia ML programming workshop on October 18–21, 2021. This workshop attracted more than 200 participants from across the Lab. The Laboratory's Information Science and Technology Institute and the Center for Space and Earth Science sponsored the workshop.

Workshop recordings for independent viewing will be posted on the workshop webpage, and the technical team will provide continued support. This team presented Julia programming guidance, sessions supporting data visualization and analysis, parallel computing, GPU acceleration, and differentiable programming, in addition to supervised, unsupervised, and physics-informed ML.

Vesselinov and colleagues developed the SmartTensors for Artificial Intelligence platform, which recently won two R&D100 awards, the so-called "Oscars of Invention." SmartTensors is an open-source (soon commercialized), scalable, unsupervised ML software suite capable of identifying and extracting essential hidden features and then efficiently compressing information in massive data sets.

## Laboratory Scientists Take Top Prizes in National Competition to Help Improve Electrical Grid

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Two Laboratory scientists took top prizes at a prestigious Advanced Research Projects Agency–Energy (ARPA-E) competition for developing algorithms designed to improve electrical grid resiliency and efficiency.

An algorithm developed by Hassan Hijazi of Applied Mathematics and Plasma Physics took first place in all four divisions, whereas the one developed by Carleton Coffrin of Information Systems and Modeling placed second in two of the four divisions.

A United States government agency, ARPA-E promotes and funds research and development of advanced energy technologies. Because grid security is a national security issue, the Laboratory is highly involved in helping to develop mathematical solutions associated with grid-optimization challenges. The fact that Hijazi's and Coffrin's algorithms outperformed 14 other entries illustrates the quality of the Laboratory's work in this area.

## Laboratory Scientist Vania Jordanova Named American Geophysical Union Fellow

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The American Geophysical Union (AGU) recently named Vania Jordanova (Space Science & Applications) one of 58 new fellows this year. These new fellows will be honored at the AGU Fall Meeting. Since 1962, AGU has elected less than 0.1 percent of its members to join this prestigious group of individuals.

Jordanova specializes in theoretical, numerical, and observational studies of the Earth's magnetosphere and the dynamics of geomagnetic storms. She serves as the principal investigator on the Space Hazards Induced near Earth by Large Dynamic Storms ([SHIELDS](#)) project, which predicts space weather hazards. She is also the co-investigator of "Impacts of Extreme Space Weather Events on Power Grid Infrastructure: Physics-Based Modelling of Geomagnetically Induced Currents during Carrington-Class Geomagnetic Storms." The SHIELDS project won an R&D 100 award in 2017.

For nearly 15 years, Jordanova worked on two instrument teams for NASA's Van Allen Probe missions. These teams studied plasma structures and dynamic processes in the Earth's radiation belts. She chairs the National Science Foundation (NSF) Geospace Envi-

ronment Modeling (GEM) Steering Committee. The purpose of the NSF GEM program is to support basic research into the dynamic and structural properties of geospace, leading to the construction of a global geospace model with predictive capability.

## New Images from Mars Indicate Massive Flash Floods in the Red Planet's Past

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SuperCam has transmitted new images from Mars that show evidence of delta and flood deposits, which scientists believe resulted from massive flash floods and various periods of stability on the Red Planet. The deltas are an ideal place to search for signs of ancient life.

Developed at the Laboratory, SuperCam is a remote-sensing instrument that sits atop of Perseverance rover currently on Mars. SuperCam's new images also show large boulders that were washed down a now-dry river — such boulders could have been moved only by powerful floodwaters. The location of the boulders also tells researchers that a lake was not full at the time of the flash floods, indicating fluctuating water levels in the far distant past. These fluctuations could mean that Mars experienced changes in climate over time.

Scientists will use the images taken by SuperCam to help decide where the Perseverance Rover will travel next to collect more samples that will be returned to Earth for subsequent analysis.

## Newly Available GPS Data Set Enables Scientists to Better Understand Ionosphere

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In collaboration with the National Oceanic and Atmospheric Administration, the Laboratory has released a new GPS data set designed to help scientists better understand the ionosphere and its potential impact on communications and positioning, navigation, and timing. These components are essential for many critical operations.

Because radio signals from satellite- or ground-based transmitters can travel through the ionosphere or bounce off it, conditions in the ionosphere could disrupt communications depending on electron density. This new set of data will enable scientists to develop better models that can help them predict the behavior of the ionosphere and thus improve the reliability

of communications critical for both everyday life and national security.

Defined as the boundary between the Earth's atmosphere and space, the ionosphere stretches approximately 40 to over 250 miles above the Earth's surface. It consists of tenuous atmosphere and charged particles (ions and electrons) that interact with traversing radio waves. The behavior of the ionosphere reacts to Earth weather, such as thunderstorms, wind, and hurricanes, as well as space weather created by solar winds affecting the Earth's magnetic field.

## Proton Radiography Facility Conducts Cerium Double-Shock Experiments

During the week of September 6, the Laboratory fielded three cerium double-shock experiments at the Los Alamos Neutron Science Center's Proton Radiography (pRad) facility. Specially designed targets enabled personnel to shock the cerium twice during a single experiment by using a pRad powder gun.

The pRad dynamic radiographs provide measurements of density in the ambient, first- and second-shocked states. Scientists will use these data to constrain the multiphase equation-of-state for cerium; they will also compare these data with recent experiments using velocimetry and x-ray diffraction to study the high-pressure solid region of the cerium phase diagram.

## Scientific American Article Tells Story of an Unsung Female Pioneer of Computer Simulation

An article in a recent issue of *Scientific American* tells the story of how in 1952 a Los Alamos computer programmer, Mary Tsingou, contributed to a famous experiment by Enrico Fermi, John Pasta, and Stanislaw Ulam, and how her contributions are at last getting the recognition they deserve.

For an experiment designed by Fermi, Pasta, and Ulam, Tsingou wrote an algorithm, programmed the MANIAC computer, and ran the simulation over and over, along the way making adjustments and debugging/altering input to compare results. The experiment has historically been named the Fermi-Pasta-Ulam problem, or FPU, after the three physicists who authored the 1955 report, but many scientists now refer to it as the Fermi-Pasta-Ulam-Tsingou problem, or FPUT. In

the original Los Alamos report, a column lists "work by" the three authors, plus Mary Tsingou, and the first page includes a footnote thanking her.

Although a few physicists read a preprint of the 1955 report, the experiment was not widely disseminated until Fermi's collected papers were published in 1965. The FPUT's results revealed a completely new way to think about and test problems that could not be previously tested. Since then, the method of using computers to conduct experiments has become standard in many fields.

### MISSION OPERATIONS

## ARIES Program Meets End-of-Year Milestones

The Advanced Recovery and Integrated Extraction System (ARIES) program has met milestones across much of its FY21 operations. For example, the ARIES pit cutter has been working for the past 5.5 years, culminating in a successful Management Self-Assessment in FY21. A significant effort, this pit cutter will enable the ARIES mission to both accelerate its stabilization of Pu-239 and facilitate the removal and disposition of material at other DOE sites.

ARIES group AMPP-3 also completed Management Self-Assessment readiness activities for the thermogravimetric analysis of material. Such analysis must occur to meet quality requirements prior to shipment from TA-55. It will also enable workers to measure and reduce risk to the Laboratory's mission.

## External Review Details Laboratory's Environmental Compliance

Independent company Parsons Corporation recently documented the Laboratory's environmental compliance in the document titled [Supplemental Environmental Project: Second Independent External Triennial Review](#). This document summarizes the Lab's compliance with permits and related requirements. This report concluded in part that the Laboratory's "demonstrated commitment to the environment will protect our resources and our communities."

The LANL Triennial Review scope was developed in accordance with the Settlement Agreement and Stipulated Final Order between the New Mexico Environment

Department, Department of Energy, and Los Alamos National Security, LLC, dated on January 22, 2016, and in response to the 2014 incident at the Waste Isolation Pilot Plant.

As one of the five supplemental environmental projects of the Settlement Agreement, the LANL Triennial Review is a systematic, independent, and documented process of objectively reviewing environmental regulatory compliance and related Laboratory operations. The Triennial Review Team conducted the review through a series of document and record reviews, interviews, and site visits.

The Review Team noted in part that the Laboratory is “. . . overall compliance in the focus areas charged in the Second Triennial Review. . . . Environmental compliance by Triad and N3B is effective. Personnel were knowledgeable and responsive to feedback and candid about challenges.”

Another part of the report discussed the Laboratory’s cooperative efforts with the Review Team’s assessment: “Interactions with [Laboratory] staff during the Triennial Review reflect a culture of cooperation, integrity, and a commitment to environmental compliance. During the review, requests for information were met with prompt and courteous responses. [Laboratory] personnel involved in all the Triennial Review focus areas have a long and strong working relationship with regulators, as reflected in the correspondence and feedback from agency representatives. Every individual interviewed demonstrated appropriate levels of expertise and awareness of their responsibilities. Moreover, both N3B and Triad strive to use systems and procedures to continue to improve compliance.”

## Laboratory Among “The 20 Best Research Companies to Work For” for Women

The organization [InHerSight](#) in October 2021 ranked the Laboratory among “The 20 Best Research Companies to Work For” for women. The organization generated this top-20 list “based on anonymous employer ratings and reviews from women who work there.” Research companies on the [current list](#) have 10 or more submissions as of October 1, 2021; scores for the Laboratory were based on 757 ratings from 44 employees.

To generate this list, [InHerSight](#) personnel collect data on 18 key metrics, such as flexible work hours, mater-

nity and adoptive leave, family growth support, salary satisfaction, mentoring, management opportunities for women, and female representation in leadership positions. Based on these data, organizations can better understand how their policies are perceived, how they can better attract and support top female talent, and how that can build improved work environments for women.

## Laboratory Director Thom Mason Holds Employee Meeting on Laboratory’s Future and its Role in National Security

In his latest all-hands Town Hall meeting (watch a [video](#) of this event), Laboratory Director Thom Mason challenged the Laboratory to maintain its FY21 momentum in terms of hiring, procurement, and work execution. Mason discussed the need to continue focusing on safe and secure conduct of operations throughout the Laboratory. He also gave updates on employees who left the Laboratory because of the COVID-19 vaccine mandate.

Other topics at the Town Hall included accomplishments in the Weapons Program, Science Technology & Engineering, Operations, and Community Relations. Mason highlighted the contributions the Laboratory will make to the Nuclear Posture Review from the new Administration, upcoming challenges to the pit mission, and previewed what is to come in the 2021 Laboratory Agenda. The director wrapped up the meeting by answering employee questions about teleworking and COVID-19 boosters.

## Laboratory Named Among Best Companies by LATINA Style, Inc.

LATINA Style, Inc., named the Laboratory as one of the 2021 Top 50 Best Companies for Latinas to work for in the United States. This year, the Laboratory [ranked 30 out of 50](#), up three spots from last year’s rankings. The Laboratory has appeared in these rankings for four years in a row — it is the only national laboratory named as a “best company.”

Companies that responded to LATINA Style, Inc.’s, questionnaire — including the Laboratory — were evaluated based on matters that LATINA Style, Inc., magazine readers deemed as important to them in the workplace. Among the principal areas of evaluation were the number of Latina executives, Latina reten-

tion, mentoring programs, educational opportunities, employee benefits, active affinity groups, and Hispanic community relations. Evaluations for the 2021 report were based on 2020 data.

With a readership of more than 600,000, *LATINA Style*, Inc., magazine addresses the needs of Latina professionals and business owners in the United States. Its annual report identifies corporations that provide the best career opportunities for Latinas in the country.

## Laboratory Powers Up New Substation in its Main Technical Area

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On October 14, 2021, crews from the Associate Laboratory Directorates for Capital Projects (ALDCP) and Facilities and Operations (ALDFO) transferred power from the old substation to a new facility at TA-3, the Laboratory's main technical area. This new substation will serve as a reliable and safe power source for many key Laboratory areas, such as the Strategic Computing Complex, National Security Sciences Building, and the Dual-Axis Radiographic Hydrodynamic Test facility, in addition to meeting the needs of Los Alamos County.

The 70-year-old substation suffered from various issues, such as outdated equipment, aging transformers, limited flexibility and operability, and overall lack of reliability. During this station's tenure, power-grid technology improved, so it became necessary to build a new station that aligns with today's modern systems. Moreover, the new substation has improved safety mechanisms, such as high-speed arc-flash protection and an advanced grounding grid.

Another feature of the new substation is its air circuit breakers, which are more environmentally friendly than the oil circuit breakers used in the old substation. The new substation also uses a "bus bar" construction method for its conductors—this construction increases its current carrying capacity and allows for expansion and greater flexibility as power needs change throughout the station's lifetime.

## Laboratory's Capital Projects Directorate Reorganizes to Meet Expanding Mission

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To meet the Laboratory's expanding mission, leaders in the Capital Projects Directorate introduced the Project Partnership Model, which they have used to create a

foundation for the organization's new structure. Using the model, leaders will deliver high-quality, cost-effective projects to the Laboratory. Such delivery will always keep safety and security in mind.

This new Project Partnership Model will enable engagement with anyone who has a stake in all aspects of the project, including design and funding, construction, any changes throughout the course of the project, and its completion. Thanks to this model, the updated structure of the directorate will ensure that project teams work closely with each organization throughout the project's life cycle, thus enhancing overall performance.

Capital Projects leadership is working with other project-executing organizations (e.g., Facilities/Operations and Plutonium Infrastructure) at the Laboratory to communicate the Project Partnership Model, as well as to appropriately codify into Triad National Security, LLC's, Capital Asset and Construction policies and procedures.

A key part of implementation consists of not only establishing performance and delivery goals but also defining Key Performance Indicators—both objectives should be completed in early October 2021. A communications plan will also be created. Personnel will use this plan to maintain transparency and engagement with all team members and stakeholders. The first monthly status meeting for this new project is scheduled for early December 2021.

## Laboratory's FY21 Accrued Cost Strives to Support Institutional Mission

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The Laboratory's Finance and Controller divisions recently led a Laboratory-wide effort to record cost in advance of vendor billing (an accrual), which totaled \$150.7 million for the FY21 closing (compared to the unburdened total of \$151.1 million in FY20 closing).

Although the numbers suggest a routine effort, the circumstances and the composition of the total and expanded participation from Acquisition Services Management (ASM) and Software Applications Engineering (SAE) divisions reveal the collaborative efforts required to maximize accrued cost to programs. Coordination with ASM and SAE enabled Ariba procurement software to support accrual activities of the Finance and Controller divisions and contribute to a successful closing.

The FY20 and FY21 year-end closings were almost exclusively accomplished almost using remote technology. The Controller's accrual systems advancement in FY20 allowed for an all-electronic way to process purchase orders, p-card expenses, and miscellaneous accruals.

Seamless teamwork and leadership resulted in new solutions at the crossroads of a fiscal-year closing and implementation of a new procurement application. Critical fiscal-year closing activities appeared routine, thanks to the tremendous efforts of organizations within the Associate Laboratory Directorate for Business Management.

## New Programmable VizRad Frisk System Takes RCT Training to a New Level

The Laboratory recently adopted a new virtual training system to improve real-world experience for students in its Radiation Protection Training (RCT) program. This new system, known as "VizRad Frisk," is a whole-body frisking simulator that provides real-time feedback to a contamination instrument while tracking and evaluating survey accuracy. Key features of the new system include spatial recognition and tracking, as well as audible alarms for frisking speed and distance that provide students with an objective measure of performance.

## OPEXatLANL Helps Stave Off Knowledge Loss

As a high percentage of the Laboratory's workforce nears retirement, it is important that repositories of knowledge be used properly to avoid a significant loss of knowledge so that new, younger workers can continue to carry out the Lab's mission. Once such knowledge repository, available to most Laboratory workers, is known as [OPEXatLANL](#), a web-based collection with customizable email notifications.

The goal of the team working under Operating Experience and Lessons Learned (OPEX) is to capture and apply lessons taken from operating experiences internal and external to the Laboratory to avoid repeat events, anticipate and mitigate undesirable consequences, and replicate best practices. To help meet this goal, the OPEX team in July 2021 developed a survey to determine who uses OPEXatLANL, how often it is used, and for what purposes it is used. The survey results are

[available here](#) and recently were shared at meetings and through employee communications.

Based on the results, the OPEX team is considering several possible improvement opportunities to help ensure employees are aware of OPEXatLANL and are using the information to improve safety and work processes. The OPEX program is run by the Institutional Quality and Performance Assurance Division under the Associate Laboratory Directorate for Environment, Safety, Health, Quality, Safeguards, and Security.

## Prototype Fabrication Improved Security by Clearing Waste, Legacy Items, and Outdated Parts

Working in conjunction with Operational Readiness & Execution, Radiation Protection, Waste Management, and Nuclear Material Control and Accountability, the Prototype Fabrication (PF) Division packaged, loaded, and shipped 40 drums of Depleted Uranium machining residue (chips) to a waste-processing facility, where this radioactive material is treated and disposed of. The last time a shipment of this type was conducted was before 2014.

Personnel conducted this operation with no safety and security issues. Shipping this material relieved a substantial radioactive load previously placed on both the Plutonium Facility (PF) and the Laboratory was a whole. PF teams also prepared and shipped a USA DOT 7A Type "A" receptacle containing a Blower from SM-102. This large receptacle, a legacy piece of equipment, was used in the radioactive machining section of PF — this equipment had not been used in recent years. Its removal proved successful due to the diligent handling of all key aspects of this operation.

In another effort in conjunction with Experimental Device Engineering and Assembly, PF successfully coordinated, packaged, and shipped 109 classified parts out of classified holdings for subsequent destruction. Many of these items were made decades ago and were no longer compatible with today's technology. Transferring these outdated components for destruction greatly reduced PF's security footprint.

## Recruiting and Hiring Efforts in ALDWP Prove Fruitful

On September 29–30, the Associate Laboratory Directorate for Weapons Production (ALDWP) hosted a virtual hiring event, which focused on positions for

Manufacturing Managers, Research Technicians, Research Technologists, Special Materials Specialists, and Operations Support Specialists. Attending the event were 48 individuals from 20 states, with the majority of attendees local to New Mexico. At the event, Laboratory personnel made 13 on-the-spot offers. In total for FY21, ALDWP had 337 external and 145 internal hires, yielding an overall total of 482 new hires.

## STEM Workforce Diversity Magazine Names Laboratory as One of “Top 20 Government Employers”

The Laboratory was named ninth among the “Top 20 Government Employers,” as determined by readers of *STEM Workforce Diversity* magazine (summer 2021).

Randomly selected magazine readers ranked employers for whom “they would most prefer to work, or believe would provide a positive working environment for science, technology, engineering and math (STEM) professionals who are members of minority groups, women, and people with disabilities.” [\*STEM Workforce Diversity\* magazine](#) is an [Equal Opportunity Publication](#).

“The Laboratory is very intentional about its diversity, inclusion and belonging initiatives, and we appreciate seeing this work recognized,” said Laboratory Diversity Officer, C. J. Bacino. “As we continue to develop new strategies to address these important issues, public acknowledgements — especially from the STEM community — help strengthen the Laboratory’s reputation as a diverse and inclusive employer of choice.”

## Team Completes CMM2 Electric Installations and Systems Testing

On September 29, 2021—one day ahead of schedule—a team completed electric installations and systems testing on the Infinity Coordinate Measuring Machine (CMM2). This milestone enables additional measuring capacity to keep up with pit production demands on the Infinity CMM1 and remain on schedule, and thus brings the Laboratory another step closer to acquiring the capability to fulfill the 30-pits-per-year mission.

Completing the electrical system is a prerequisite for the CMM2 fully integrated, self-contained, automated glovebox temperature control (GBTC) system. The GBTC system maintains temperature within the glovebox to a required 20 degrees Celsius at +/- 1 degree

Celsius; it typically holds temperature to within 0.1 of a degree. Such impressive temperature regulation greatly improves inspection accuracy, enabling CMM2 to perform ultra-high-accuracy measurements in sub-microns that are far beyond human eyesight.

Launched in 2013, the construction of the CMM2 project should be completed by November 2022.

## Team Completes Life-Safety Beneficial Occupancy Stairwell Restoration at RLUOB

In late September 2021, a team made up of more than 100 members from the Laboratory and the NNSA came together. This team completed life-safety beneficial restoration of seven sets of stairwells, in addition to replacing and repairing more than 45 fire doors. All this work took place at the Laboratory’s Radiological Laboratory Utility Office Building (RLUOB).

Two years ago, significant fire-protection deficiencies that detrimentally impacted life-safety egress were discovered in various RLUOB stairwells. To address this issue, the Laboratory formed an integrated project team (IPT) made up of more than 100 members from the following organizations: facility operations fire protection subject-matter experts and engineers, maintenance personnel, Program-Project Interface (PPI), the RLUOB Equipment Installation-Phase 2 project, the Weapons Infrastructure Program Office (WIPO), NNSA Field Office, and NNSA Acquisition and Project Management Office.

The IPT investigated the extent of conditions, determined the disposition path, identified funding, and performed the repairs. All repairs and restorations were made to meet 2-hour fire-rating code requirements for means of egress. The team restored beneficial occupancy in approximately 18 months with minimal disruption to more than 400 residents in RLUOB.

## Twelve Craft Workers Recognized for Outstanding Service, Mentoring, and Engagement

At the September Associate Laboratory Directorate for Capital Projects all-hands meeting, 12 craft employees were honored for demonstrating exemplary attitudes, behaviors, and practices in their work. As part of the monthly recognition series, honored employees receive

a certificate and a gift, both of which are presented by the Integrated Health and Safety officer.

At this meeting, a team of 10 craft electricians was recognized for exceptional customer service in meeting the needs of the Protected Transmission System project for the Network and Infrastructure Engineering Division. This team has supported many projects throughout the Laboratory, and it has done so without incurring any injuries or incidents. This exceptional safety record reinforces a healthy culture of teamwork and adherence to the Safe Conduct of Research (SCoR) Principles exhibited by the members of this team.

Also recognized were two craft painters. One painter was recognized for his willingness to mentor co-workers and apprentices. A second painter earned recognition for his efforts to engage workers across many craft disciplines during his work on the TA-03 Building 38 Renovation Project.

#### COMMUNITY RELATIONS

## Laboratory Project Uses Helps the Community Solve Data-Related Problems

The first Northern New Mexico Community Data Sprint concluded last month. This data sprint paired local nonprofit and education organizations with Laboratory data scientists to solve data-related problems to benefit northern New Mexico.

Led by Lissa Moore of Information Sciences (CCS-3), 11 Laboratory data scientists worked full-time for a week on this joint project, along with individuals from Northern New Mexico College (NNMC), Santa Fe Community College (SFCC), and nonprofit Rocky Mountain Youth Corps (RMYC). The collaborators then wrote up their reports and recommendations and held meetings with the partners to explain their findings.

This data-sprint project focused on improving student retention rates by analyzing risk factors and signs of academic and professional success. RMYC provides workforce development training and educational programs to young people in New Mexico, and the nonprofit was looking to understand its general impact and performance with respect to gender diversity.

The Laboratory's Information Science & Technology Institute paid for the researchers' time, with the program coordinated under the Laboratory's Community Technical Assistance initiative, which makes the Labo-

ratory's unique expertise and capabilities available at no cost to tribal entities, governmental entities, and nonprofits located in the seven counties of northern New Mexico.

## LANL Foundation Awards Grant to Regional Partnership School to Support Teacher Professional Development

The Los Alamos National Laboratory Foundation has awarded The Regional Partnership School (RPS) \$40,000 over two years to support teacher professional development. RPI is an educational partnership between the Laboratory's Math and Science Academy, Pojoaque Valley School District, and New Mexico Highlands University. All three agencies are committed to improving the educational pipeline for northern New Mexico.

This funding will go toward the following:

- Professional development in teaching mathematics. These sessions will take place four times throughout the school year and five days each summer through October 2023. Professional development includes stipends for teachers to attend mathematics professional development on Saturdays.
- Books and materials to support professional learning.
- Teacher attendance at the National Council of Teachers of Mathematics Conference.

## Latest Periodic Table Event Earns Perfect Net Promoter Score

On September 20, 2021, R&D engineer Benigno Sandoval of Space Instrument Realization (ISR- 5) was the guest speaker at the latest Periodic Table informal science outreach event held at the Bathtub Row Brewing Co-op in Los Alamos.

At this event coordinated by the Bradbury Science Museum, Sandoval discussed the process of creating custom instruments used in space for applications not only in national security but also for exploring Mars and beyond. At the end of his talk, Sandoval answered questions from the 28 attendees — more than double the size from the previous talk's audience. Like the premier event last month, this event earned a perfect 100 Net Promoter Score from participants.

The next event in the series takes place on October 18, 2021, when Joel Kulesza of Monte Carlo Codes (XCP-3) will talk about the Monte Carlo code, arguably the most important invention at the Laboratory.

## Mark Galassi Selected as One of the Santa Fe New Mexican's "10 Who Made a Difference" for 2021

A winner of this year's inaugural LANL Community Relations Medal, Laboratory scientist Mark Galassi of Space Science & Applications (ISR-1) has been honored as one of the Santa Fe New Mexican's "10 Who Made a Difference Awards" for his educational outreach activities. The newspaper will write a profile of each winner in a special-edition magazine published on Thanksgiving weekend.

Over the past 15 years, Galassi has implemented a unique pipeline that targets students with disadvantaged backgrounds. The pipeline takes such students from elementary school chess clubs through to college internships, where student mentors work with the students and subsequently help them land their first jobs in science.

In part working through his nonprofit, the [Institute for Computing in Research](#), Galassi has helped more than 350 students across northern New Mexico. Students who went through the early years of the pipeline now work as professors at major research universities while others have founded successful companies in machine learning and cybersecurity.

## Virtual Event Enables Regional Leaders to Learn About Laboratory Workforce Pipeline Programs and Opportunities

On October 6, 2021, the Laboratory's Community Partnerships Office hosted a well-attended virtual Community Conversation that focused on workforce development. Laboratory Director Thom Mason led a pre-recorded, 20-minute panel discussion about the Laboratory's workforce pipeline programs with an emphasis on skilled building trades and the wealth of opportunities at the Lab and nationwide.

Mason stressed that in the past two years, 70 percent of the Laboratory's new hires have been New Mexicans. More than 100 regional leaders in education, nonprofits, and economic development attended the

event. The panel-discussion video will be posted online and shared on social media to reach a larger audience.

## SELECTED MEDIA COVERAGE

### [Daily on Energy](#)

*Washington Examiner* (9/22)

The White House revealed the names of 30 scientists and academics who will advise Biden on policy as part of the Council of Advisors on Science and Technology, including Marvin Adams, a nuclear engineer who chairs the Mission Committee at Los Alamos National Laboratory.

### [Los Alamos National Lab Updates Vaccine Requirements for Staff](#)

*KRQE-13* (9/22)

Los Alamos National Laboratory is putting its foot down on its vaccine mandate for employees with a new deadline for them to be fully vaccinated by October 15. It also has a new policy for those who were granted religious exemptions.

### [NNSA Awards \\$7 Million to Minority-Serving Institutions in New Mexico and S.C. to Support Plutonium Pit Production](#)

*Los Alamos Daily Post* (9/23)

The U.S. Department of Energy's National Nuclear Security Administration (DOE/NNSA) awarded \$7 million for workforce development and training supporting plutonium pit production to minority-serving educational institutions in New Mexico and South Carolina.

### [Ice Melt at the Poles is Now Causing Hidden Changes to Earth's Crust on a Huge Scale](#)

*Science Alert* (9/24)

"Scientists have done a lot of work directly beneath ice sheets and glaciers," says geophysicist Sophie Coulson, from Los Alamos National Laboratory in New Mexico. "So they knew that it would define the region where the glaciers are, but they hadn't realized that it was global in scale."

### [Local STEM Superstar Harshini Mukundan Featured on Emmy-Nominated Kids TV Show 'Mission Unstoppable'](#)

*Los Alamos Daily Post* (9/24)

Saturday, Oct. 2, Los Alamos-based microbiologist, Harshini Mukundan, will be a guest on the season 3 premiere of CBS' series, 'Mission Unstoppable'.

### [NASA's Perseverance Mars Rover Snaps an Epic Selfie Along with 'Mission-Critical' Views of Red Planet](#)

*Space.com (9/24)*

The rover's SuperCam aids in the search for past life by firing a laser at mineral targets and analyzing the mineralogy and chemistry of the vaporized rock. The SuperCam includes the Remote Micro-Imager, which can zoom in on features the size of a softball from more than a mile away, according to the statement.

### [Shaking Up a Visit to the Museum](#)

*Albuquerque Journal (9/26)*

The museum houses some 60 interactive exhibits tracing the history of the World War II Manhattan Project, and also highlights the Los Alamos National Laboratory's current and historic research projects related to defense and technology, with a focus on research on national and international economic, environmental, political and social issues. Lab scientists worked hand in hand with museum curators to develop the exhibits that draw nearly 80,000 visitors a year.

### [Upgrade will Protect National Security and Community Interests](#)

*Albuquerque Journal — Guest Column by Ted Wyka, NNSA Los Alamos Field Office Manager (9/26)*

To accomplish today's missions and make sure we can accomplish tomorrow's, LANL requires increasing amounts of electricity. Because the need for LANL's expertise is so great, we anticipate the laboratory's peak seasonal power demand will exceed operating limits for its and Los Alamos County's existing transmission lines by 2030. The U.S. Department of Energy's National Nuclear Security Administration is proposing to upgrade its electrical power capacity serving this area of New Mexico. The project, referred to as the Electrical Power Capacity Upgrade, or EPCU, would provide the laboratory and Los Alamos County with reliable and redundant electrical power.

### [LANL: Frontiers in Science Speaker Taraka Dale on New Solutions to Plastic Pollution Sept. 29](#)

*Los Alamos Daily Post (9/27)*

Taraka Dale is honored as this quarter's Frontiers in Science speaker by the Los Alamos National Laboratory Fellows. Her talk will be distributed 6 p.m., Wednesday, Sept. 29, on the Laboratory [YouTube channel](#). She is the LANL team lead for the BOTTLE Consortium, an alliance of 10 research institutions and the U.S. Department of Energy striving to use Bio-Optimized Technologies to keep Thermoplastics out of Landfills and the Environment. Each institution is contributing to solve the global plastic problem in a unique way.

### [Polar Ice Melt Causes Global Shifts in Earth's Crust, Harvard Grad Finds](#)

*The Harvard Crimson (9/27)*

As ice sheets melt in Greenland and the Antarctic, the water that is generated shifts the planet's crust on a global scale, reveals a new theoretical model by a researcher who recently completed her Ph.D at Harvard. Sophie L. Coulson, who received her doctorate in Earth and Planetary Sciences in May, and other researchers at the Los Alamos National Laboratory, where she is now a fellow, published their findings in the peer-reviewed journal *Geophysical Research Letters* last month.

### [What is Valley Fever and What are the Symptoms as Cases Rise in Southwest U.S.](#)

*Newsweek (9/27)*

Speaking to climate change news outlet Grist earlier this month, Morgan Gorris, an Earth systems scientist at Los Alamos National Laboratory in New Mexico who has investigated the conditions in which *Coccidioides* thrives, said the fungus tends to prefer hot, dry places.

### [DOE/NNSA Los Alamos Site Office Head Briefs County Council on Pit Production, COVID, Omega Bridge and More](#)

*Los Alamos Reporter (9/28)*

Ted Wyka, Department of Energy National Security Administration Los Alamos Field Office Manager, gave Los Alamos County Council a quarterly update Tuesday (September 21) addressing the LANL Pit Production Project, COVID-19, Rendija Canyon, the Omega Bridge and other topics.

### [NASA's Hubble Captures Storm in Jupiter's Great Red Spot Speeding Up](#)

*India News 18 (9/28)*

Now, scientists at NASA and the University of California, Berkeley, and Los Alamos National Laboratory, United States, have discovered that the winds in the outer "lanes" of the storm are speeding up.

### [An Unsung Female Pioneer of Computer Simulation](#)

*Scientific American (9/29)*

Mary Tsingou Menzel is a very humble scientific game changer. Still living in Los Alamos with her husband, Joe Menzel, she expresses surprise at the significance of the experiment she programmed almost 70 years ago. She also continually asserts that she has never felt slighted by not being included in the naming of the problem.

### [Intel Launches 2<sup>nd</sup> Loihi Neuromorphic Chip; LANL Investigating 'Trade-Offs' Between Quantum and Neuromorphic Computing](#)

*Inside HPC (9/30)*

"Investigators at Los Alamos National Laboratory have been using the Loihi neuromorphic platform to investigate the trade-offs between quantum and neuromorphic computing, as well as implementing learning processes on-chip," said Dr. Gerd J. Kunde, staff scientist, Los Alamos National Laboratory.

### [Reducing Plastics with Proteins: LANL Scientist Honored for Research on 'Plastic-Eating' Proteins](#)

*The Taos News (9/30)*

Plastic waste is a growing existential threat polluting our land and water, but an international group of scientists are working on new ways to make — and break — plastics.

### [Catalog Raises \\$35M to Commercialize its DNA Data Storage Process](#)

*BostInno (9/30)*

A Boston company working on storing digital data in synthetic DNA has attracted a new round of funding to help it work on its science fiction-esque vision of building chemical computers.... As far out as the company's ideas sound, it's a concept that's been entering the mainstream in recent years. There's a new trade group dedicated to DNA data storage, founded in part by Microsoft and including the Department of Energy's Los Alamos National Laboratory.

### [LANL: Four Los Alamos Researchers Named 2021 Laboratory Fellows](#)

*Los Alamos Reporter (9/30)*

Four researchers have been named 2021 Los Alamos National Laboratory Fellows: Baolian Cheng, Elizabeth Hunke, David A. Smith and Blas Uberuaga. "To be a Fellow at the Laboratory is to be a leader in our workplace and within the scientific community at large," said Thom Mason, Laboratory director. "I am honored to recognize these four fellows and thank them for their extraordinary contributions and accomplishments."

### [Nonprofit Brings Agriculture to Kids](#)

*Taos News (9/30)*

"Part of the mission of this is also to bring farm food to the school lunch table," said Cain. "Getting the kids out in the garden – they recognize the food, taste the food – they see the food on the plate and it's gonna get eaten." Growing Community Now is funded by a United States Department of Agriculture Farm to School grant, and by local nonprofits including LOR Foundation,

Taos Community Foundation and Los Alamos National Laboratory.

### [Reducing Plastics with Proteins](#)

*Taos News (9/30)*

Plastic waste is a growing existential threat polluting our land and water, but an international group of scientists [is] working on new ways to make – and break – plastics.

### [Is Houston's Air Quality Triggering Crazy Thunderstorms?](#)

*Houston Press (10/1)*

Working with researchers at the University of Houston, TRACER scientists—aka TRacking Aerosol Convection interactions ExpeRiment, a study being carried out by the federal Department of Energy's Atmospheric Radiation Measurement user facility—from Brookhaven National Laboratory, Los Alamos National Laboratory, and other institutions will collect data on aerosols and atmospheric characteristics.

### [Learning Curve](#)

*Science (10/1)*

Two groups have already shown neuromorphic chips can match the capabilities of some of the most advanced AI programs on the market. Today's workhorse AI software relies on a deep learning algorithm known as a backpropagation neural network (BPNN), which enables AI systems to learn from their mistakes as they are trained. In a preprint posted on arXiv in August, Andrew Sornborger, a physicist at Los Alamos, and colleagues reported programming the first-generation Loihi to carry out backpropagation. The chip learned to interpret a commonly used visual data set of handwritten numerals as quickly as conventional BPNNs, while drawing just 1/100 as much power.

### [LANL: Two Los Alamos Scientists Take Top Prizes in National Competition to Help Improve Electrical Grid](#)

*Los Alamos Reporter (10/4)*

Two scientists at Los Alamos National Laboratory took top prizes in a national competition for developing algorithms to help improve the resiliency and efficiency of the electrical grid.

### [Quantum Physicist Garrett Kenyon on Neuromorphic Computing](#)

*KOA AM Radio (10/4)*

Garrett Kenyon has been a staff member in the Biological and Quantum Physics group at the Los Alamos National Laboratory since 2001. His research interests involve the application of computer simulations and

theoretical techniques to the analysis of computation in biological neural networks.

### [A 'Quantum Leap' in Computing](#)

*Mission Critical (10/5)*

The CRADA will help researchers at LANL solve complex graph-partitioning and constrained optimization problems. Through this process of using quantum and classical techniques, graphs will be more easily converted into a form that can be run against the D-Wave annealer, handing LANL a diverse yet accurate set of results for these complex computations.

### [Exploring the Promise of Silicon Anodes for a High-Capacity Battery](#)

*AZO Nano (10/6)*

Silicon is a staple of the digital revolution, shunting loads of signals on a device that's likely just inches from your eyes at this very moment. Now, that same plentiful, cheap material is becoming a serious candidate for a big role in the burgeoning battery business. It's especially attractive because it's able to hold 10 times as much energy in an important part of a battery, the anode, than widely used graphite.

### [LANL Honors Four for Research and Leadership with Laboratory Fellows Prizes](#)

*Los Alamos Reporter (10/6)*

Bill Daughton, Andrew Gaunt and Cristiano Nisoli will receive the Fellows Prize for Research, and Eva Birnbaum will receive the Fellows Prize for Leadership.

### [Supercomputing Effort to Model the Complex Interactions Affecting Climate Change in Arctic Coastal Regions](#)

*Phys.org (10/7)*

Coastlines are some of the planet's most dynamic areas—places where marine, terrestrial, atmospheric and human actions meet. But the Arctic coastal regions face the most troubling issues from human-caused climate change from increasing greenhouse gas emissions, says Los Alamos National Laboratory scientist Andrew Roberts.

### [Exascale Hardware Evaluation: Workflow Analysis for Supercomputer Procurements](#)

*Inside HPC (10/8)*

The goal of the Exascale Computing Project (ECP) hardware evaluation (HE) group is to modernize the metrics and predictive analysis to guide US Department of Energy (DOE) supercomputer procurements. Scott Pakin, the ECP HE lead at Los Alamos National Laboratory, notes, "Our main customer is the DOE facilities, who consider our work to be very valuable in determining the types of machines to be procured and configured.

Our work can also be used by application developers seeking to understand the performance characteristics of their codes." Also reporter in [HPC Wire](#).

### [LANL Scientist Shows Girls That They Can](#)

*Albuquerque Journal (10/10)*

Mukundan does science and STEM outreach because she believes it's important to give back to the community and bring STEM awareness to girls. It's actions like these that led her to be nominated as an ambassador for the #IfThenSheCan initiative.

### [LANL Director Says 70 Percent of Recent Hires were from New Mexico, 319 Craft Employees Hired Last Year](#)

*Los Alamos Reporter (10/12)*

Some 70 percent of recent Los Alamos National Laboratory hires were from New Mexico, Director Thom Mason said during Wednesday's virtual Community Conversations event. He said 319 of last year's hires were craft employees.

### [Los Alamos Scientists Work on Technique for Estimating Stress in Earth's Crust from Oil and Gas Activity](#)

*New Mexico Political Report (10/15)*

A new method developed by scientists at Los Alamos National Laboratory could reduce the costs of determining if proposed oil and natural gas activity could lead to earthquakes and which direction fractures are likely to occur during hydraulic fracturing.

### [New Mexico Judge Denies Los Alamos Workers' Claim in Vaccine Fight](#)

*Associated Press (10/15)*

A New Mexico judge on Friday denied a request by dozens of scientists and others at Los Alamos National Laboratory to block a vaccine mandate, meaning workers risk being fired if they don't comply with the lab's afternoon deadline. Also in the [Los Alamos Reporter](#).

### [Physicists Make Most Precise Measurement Ever of Neutron's Lifetime](#)

*Nature (10/15)*

Exactly how long it takes for a neutron to decay is random, but the average time is about a quarter of an hour. To get a precise value, Daniel Salvat, an experimental nuclear physicist at Indiana University in Bloomington, and his colleagues built an experiment called UCN $\tau$  at the Los Alamos National Laboratory in New Mexico.

### [NASA Perseverance Mission Shows Flash Floods on Mars](#)

*Santa Fe New Mexican (10/17)*

Pictures of boulders that were carried by flash floods into a lake bed might not seem too thrilling. But when it's the Perseverance rover photographing the Martian landscape and capturing evidence of dramatic weather events — and perhaps a climactic change — that occurred on this now-desolate planet billions of years ago, the images are indeed intriguing.

### [The Coronavirus is Still Mutating. But Will That Matter? 'We Need to Keep the Respect for This Virus.'](#)

*Washington Post (10/18)*

But the virus surprised the experts. The first significant change in the virus was identified by Bette Korber, a theoretical biologist at the Los Alamos National Laboratory in New Mexico. She had been scrutinizing the genomes of virus samples from around the world and noticed that one mutation, known as D614G, had become common in the virus in dozens of geographic locations. This mutation altered the positioning of the virus's spike protein — its tool for binding to cells. Korber, in collaboration with researchers at Duke University and the University of Sheffield in England, concluded that the strain with the mutation was more transmissible than the first strain that circulated in China.

### [NASA Releases Incredible Audio Captured by its Perseverance Rover on Mars](#)

*The Independent (10/20)*

"Sound on Mars carries much farther than we thought. It shows you just how important it is to do field science," said Nina Lanza, a SuperCam scientist working with mic data at the Los Alamos National Laboratory (LANL) in New Mexico.

### [Metal-Organic Frameworks Stabilize Perovskite LEDs](#)

*Physics World (10/22)*

A team led by [Wanyi Nie](#) from the [Center for Integrated Nanotechnologies](#) at [Los Alamos National Laboratory](#) has now found a way to avoid this clumping by building the crystals inside MOFs. These porous, cage-like structures effectively separate the crystals from each other, thereby preventing them from merging.

### [LANL: Three Los Alamos National Laboratory Scientists Elected 2021 Fellows of American Physical Society](#)

*Los Alamos Daily Post (10/21)*

Three Los Alamos National Laboratory scientists have been elected fellows by the American Physical Society.

The new APS fellows are Eric Brown, Takeyasu Ito and Nathan Moody.

### [Hear Sounds from the Mars Rover Captured by NASA's Perseverance](#)

*WOWK TV (10/22)*

Thanks to two microphones aboard NASA's Perseverance rover, the mission has recorded nearly five hours of Martian wind gusts, rover wheels crunching over gravel, and motors whirring as the spacecraft moves its arm. These sounds allow scientists and engineers to experience the Red Planet in new ways — and everyone is invited to [listen in](#). The body mic was provided by NASA's Jet Propulsion Laboratory in Southern California, while the SuperCam instrument and its microphone were provided by Los Alamos National Laboratory.

### [The Key for EPA Rules? Inside the Methane Tech Revolution](#)

*EENews (10/25)*

At least one company has used the supercomputers at the Energy Department's Los Alamos National Laboratory to develop its software, said Joseph King, program director for ARPA-E's methane monitor program.

### [Major US and European Labs Join Forces to Tackle Climate Change](#)

*Physics World (10/26)*

Top physics facilities in Europe and the US have come together to tackle the climate crisis. The labs — including CERN, the European Space Agency, Fermilab and the Los Alamos National Laboratory — [have announced](#) that they will step up their scientific collaboration on carbon-neutral energy and climate change as well as share best practices to improve the carbon footprint of big-science facilities.

### [NNSA and Emory Blaze Trails with New Technology Transfer Partnership](#)

*Emory News Center (10/27)*

National Nuclear Security Administration (NNSA) has always relied on academic partnerships for scientific research and to find future members of the Nuclear Security Enterprise. The latest partnership, with the Technological Innovation: Generating Economic Results (TI:GER) Program at Emory University School of Law, is a brand new way of working with students.